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TECHNICAL NOTE

Endovascular Repair of Multiple Peripheral Aneurysms via a Dual Approach Involving a Venous Graft Conduit

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Introduction

The authors report the management of a difficult surgical problem involving the repair of multiple peripheral aneurysms in a patient with a pre-existing synthetic aortic graft in whom autologous long saphenous vein was unavailable. This was carried out by an endovascular route through dual access sites, involving uniquely a venous graft conduit.

Technical Report

A 72-year-old man with a history of a coronary artery bypass graft had previously undergone several surgical procedures for aneurysmal disease including an aortic reconstruction with a Dacron aorto-bi-iliac graft, a right-sided superficial femoral artery (SFA) to below-knee popliteal long saphenous vein bypass graft, and a left-sided SFA to peroneal long saphenous vein bypass graft. Since these procedures, however, he presented with multiple aneurysms (1.6–3.6 cm diameter) extending from the left external iliac to the femorodistal graft (Figure 1).

The patient underwent endovascular repair of the aneurysms under local anaesthetic (Figure 2). An antegrade left common femoral artery (CFA) puncture and retrograde distal saphenous vein graft puncture were performed and accessed with 10 French sheaths. Dual sites were accessed to enable each to deploy a covered stent across the other sheath, thereby facilitating haemostasis on removal. The profunda femoris origin was occluded with Gianturco embolisation coils (Cook U.K. Ltd.) following a satisfactory trial balloon occlusion. The CFA puncture site was used to sequentially deploy three Wallgraft endoprostheses (nominal size 9 mm long, Boston Scientific Ltd.) within the SFA and venous graft, to exclude the aneurysmal SFA from the circulation. The distal vein graft puncture site was then used to deploy a further Wallgraft (9 mm × 70 mm) within the aneurysmal external iliac and CFA. Balloon remodelling at the Wallgraft junctions reduced any minor endoleaks. There were no immediate complications and the patient's feet remained well perfused throughout the procedure. Follow-up arterial duplex ultrasound scans at 3 days, 2 months and 3 months demonstrated graft patency with aneurysmal exclusion. The patient was discharged home 3 days following the procedure. The cost of four Wallgrafts was £3800.

Discussion

The option of extensive surgical repair via a groin approach entailing a high risk of morbidity was undesirable in this patient. Factors including *in-situ* synthetic graft infection and perioperative haemorrhage were also major concerns. Furthermore, the reconstructed aortic segment and the unavailability of both long saphenous veins would clearly complicate a surgical challenge.

The use of endovascular covered stents to repair peripheral aneurysms is a relatively new modality. Reports have been limited to only small numbers

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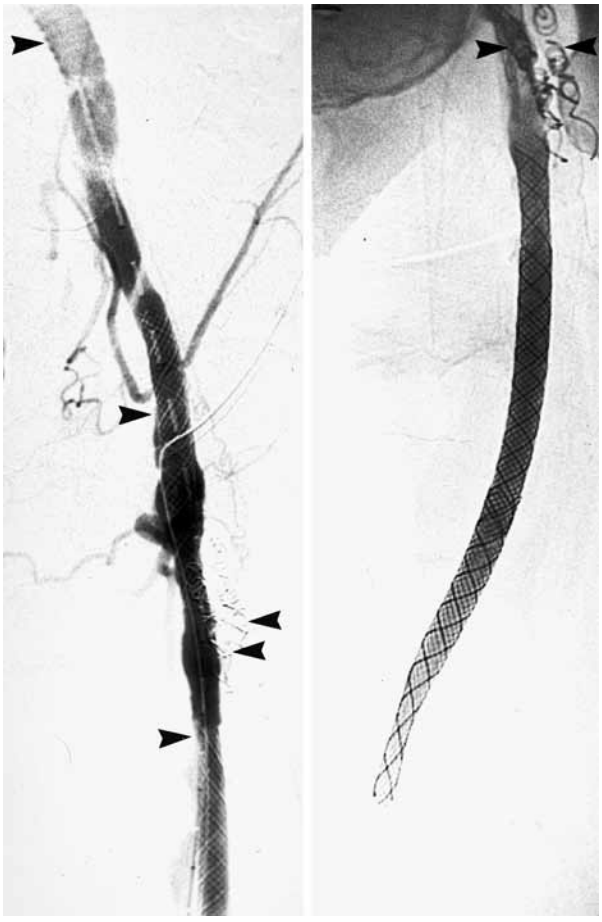
of patients and long-term durability has yet to be determined.[1–5]

Unlike these studies, however, the authors report the deployment of covered stents via a dual approach involving a venous graft conduit to repair multiple peripheral aneurysms in a patient. This was carried out without complication and without the requirement for blood transfusions. The profunda femoris origin was occluded to prevent back-bleeding and endoleak. The long-term disadvantage of this would be the sacrifice of limb perfusion in the event of graft failure.

This report demonstrates the potential for endovascular repair of multiple aneurysms in complex vascular cases. The advantages of local anaesthesia, minimal tissue trauma and rapid post-operative recovery make this an attractive modality for patients with significant co-morbidity.

Fig. 1. Arteriogram illustrating multiple peripheral aneurysms along the common femoral and superficial femoral arteries extending to the saphenous vein bypass graft (arrowed).



(a) (b)

Fig. 2. (a) Arteriogram after completion of Wallgraft deployment illustrating distal end of aorto-bi-iliac graft (arrowed), the external iliac and common femoral artery Wallgraft (arrowed) and the proximal superficial femoral artery Wallgraft assembly (arrowed). Embolisation coils are also seen within the profunda femoris artery (arrowed). (b) The superficial femoral artery Wallgraft assembly showing 3 Wallgrafts in continuity with the most distal Wallgraft placed within the proximal saphenous vein bypass graft. Embolisation coils are seen within the profunda femoris artery (arrowed).

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